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A REVIEW ON CURRENT PERSPECTIVES AND RECENT ADVANCES IN POLYCYSTIC OVARIAN SYNDROME

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Abstract- Polycystic ovarian syndrome (PCOS) is a "multispecialty" complaint suspected in cases with irregular monthlies and clinical signs of hyperandrogenism such as acne, seborrhea, Hirsutism, irregular monthlies, gravidity, and alopecia. Several advances have been made in understanding the pathophysiology in the process of changing hastily and more effective operation measures**.** The cause of PCOS is unknown and treatment is primarily grounded on the operation of symptoms. Recent studies indicated that PCOS is associated with low-grade habitual inflammation and that women with PCOS are at increased threat of non-alcoholic adipose liver compliance. Ethical predilection, hyperactive inflammation, hyperandrogenism, and low Vitamin D situations are certain factors that have been explosively associated with PCOS as well as a threat of severe COVID-19. Positive family history, rotundity/weight gain, history of epilepsy, diabetes, etc., have been linked as threat factors for PCOS among women in the reproductive age group. Life and Behavioral Approaches- lifestyle interventions such as diet, exercise, and behavioral approaches for all women with PCOS.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most common endocrine complaint in women, presenting several possible combinations of signs and symptoms and a range of phenotypes, which may include reproductive, endocrine, and metabolic differences. PCOS is characterized by a clustering of hyperandrogenism, hyperinsulinemia, metabolic pattern, menstrual dysfunction, gravidity, Hirsutism, and gestation and neonatal complications **(Yang et al., 2022)**. PCOS also contributes significantly to other long-term health pitfalls, such as type II diabetes mellitus (DM2), predilection to cardiovascular compliance (CVD) as well as anxiety and depressive diseases. Moreover, frequency estimates vary greatly among different populations, ranging from 4% to 20%, indicating a need to directly identify the proportion of women affected so applicable public health programs can be devised **(Rocha et al., 2019)** . As expressed, PCOS is a multidimensional complaint depicted by an admixed of signs and symptoms of ovarian dysfunction and androgen excess without another identifiable option. Unlike quondam causes of anovulation involving ovarian inactivity or primary insufficiency, PCOS presents with habitual anovulation in the presence of hyperactivity of the ovaries. In addition to the synchronicity of insulin resistance (IR) and rotundity, the effect of androgen excess is considered the driving force behind the seditious and metabolic precariousness associated with PCOS. Life interventions are best advised and, in so doing, drop body obesity and recoup their metabolic and reproductive health **(Akre et al., 2022).** Indeed before a definitive opinion of PCOS, adolescents with clinical signs of androgen excess and oligomenorrhoea/amenorrhea, features of PCOS, can be regarded as being "at threat for PCOS." Operation of both those at threat for PCOS and those with a verified PCOS opinion includes education, healthy life interventions, and remedial interventions targeting their symptoms. Interventions can include Metformin,

combined oral contraceptive capsules, spironolactone, and original treatments for hirsutism and acne. In addition to operation for associated co-morbidities operation should also include regular follow- up visits and planned transition to adult care providers. Comprehensive knowledge regarding the pathogenesis of PCOS will enable earlier identification of girls with high propensity to develop PCOS **(Yang et al., 2022).**

PCOS at different stages of life:

The progression of PCOS during different life stages is inadequately known because of the deficit of cohort studies with long- term follow- up. A study compared clinical and biochemical parameters of PCOS women and healthy controls who visited a medical center at a mean age of 29 times and returned 6 times latterly on average **(Roach et al., 2019)**.

PCOS in childhood The commerce between a inheritable predilection and some antenatal and postnatal environmental factors seems to take part in the pathophysiology of PCOS. Intrauterine growth deceleration or small for gravid age(or both) and high situations of androgens during the intrauterine period could lead to an increased product of glucocorticoids which may induce epigenetic variations and increase the threat of PCOS **(Roach et al., 2019).**

PCOS in adolescence- PCOS is frequently diagnosed in nonage. Menstrual irregularity, acne, and Hirsutism are the major findings in this age group. still, these features of PCOS imbrications with those of normal nonage. Family history of PCOS, fat or low birth weight, exposure to androgens during gravidity, unseasonable puberty, rotundity, and IR are threat factors that are related to the development of the pattern **(Roach et al., 2019)**.

PCOS in postmenopausal women- Women with PCOS persist with hyperandrogenism indeed after menopausal transition and continue to manifest metabolic differences and MS with increased threat of cardiovascular complaint. thus, postmenopausal women with a history of PCOS during the reproductive times may still have instantiations of the pattern **(Roach et al., 2019).**

Prevalence of polycystic ovary syndrome Polycystic ovary pattern(PCOS) is one of the most common complaint, yet most neglected, endocrinologic conditions affecting ladies of reproductive age of about 18- 44 and 6- 20. Is the frequency worldwide. The patient normal misbalance leads to the complications similar as multitudinous excrescencies, an irregular menstrual cycle that eventually leads to gravidity among ladies. Stress, rotundity, change in hormonal position is the major cause worldwide. The decreasingly high prevalence of PCOS can be attributed to inheritable factors, environmental factors, and intermarriages; still, it's considered an admixture of insulin resistance, hyperandrogenemia, and factors causing follicular abnormalities **(Cioana et al., 2022)**. 's likely that the frequency of PCOS varies significantly between civic and pastoral regions owing to different surroundings, cultures, prevalence of rotundity, and salutary practices. The perpetration of life- related variations and webbing of women with PCOS for the presence of associated threat factors is essential for planning substantial preventative health strategies. PCOS as a life complaint associated with modernization of living, they fail to include and compare population that follows ultramodern and traditional life. Until now, three studies which report the frequency of civic and pastoral Indian population were grounded in a sanitarium setting and therefore turning the population. **(Witchel et al., 2019).** Also, piecemeal from the lack of complaint mindfulness and operation as well as medical remedy according to the guidelines, women, substantially in pastoral areas, are reticent to visit gynecologists or endocrinologists for treatment despite having symptoms of the complaint. This disinclination results in utmost cases remaining undressed, leading to colorful unborn complications. Thus, the purpose of this study was to probe the clinical aspects and QOL related to PCOS. **(Cioana et al., 2022)**

Current Perspectives and Recent Advances:

Pathophysiology A contemporary genome wide meta- analysis incorporating over,000 cases of PCOS, 14 independent loci (including three new loci) linked with increased threat for PCOS were linked. No difference

whatsoever was observed in the association between colorful clinical phenotypes and a major portion of the PCOS vulnerability loci, inferring analogous beginning inheritable traits for the colorful phenotypes. The ongoing hunt for the likely driving forces behind increased androgen stashing in PCOS led to the findings of markedly elevated LH pulsatility in letrozole-treated mice, compared to that in PCOS women. This hyperactive LH palpitation stashing may be attributed to the increased hypothalamic kisspeptin and neurokinin B situations **(Li et al., 2022)**. Confused gonadotropin-releasing hormone(GnRH) pulsatility is reported as an indispensable reason for increased LH pulsatility. Intra-cerebroventricular administration of anti-Mullerian hormone (AMH) was reported to increase GnRH-dependent LH pulsatility due to the expression of AMH receptors in GnRH neurons. The formative goods of exercise on metabolism can be attributed to "irisin" a myokine convinced by exercise. A recent methodical review meta-analysis (SRMA) stated that PCOS cases feel to have standard iris in situations after adaptation for body mass indicator (BMI). Nonetheless, the response of "irisin" to hyperinsulinemia may be weakened in women with PCOS. PCOS develops during the early pubertal times. Still, the utmost applicable information has been accrued through clinical studies involving adult women in whom referral bias focuses on disquisition of the more severe phenotypes. Preclinical models involving beast and in vitro studies supplement clinical disquisition and benefit from other approaches to study this complex complaint. Recent clinical, experimental, and inheritable data emphasize neuroendocrine involvement in the pathophysiology of PCOS **(Ghazeeri et al., 2022).**

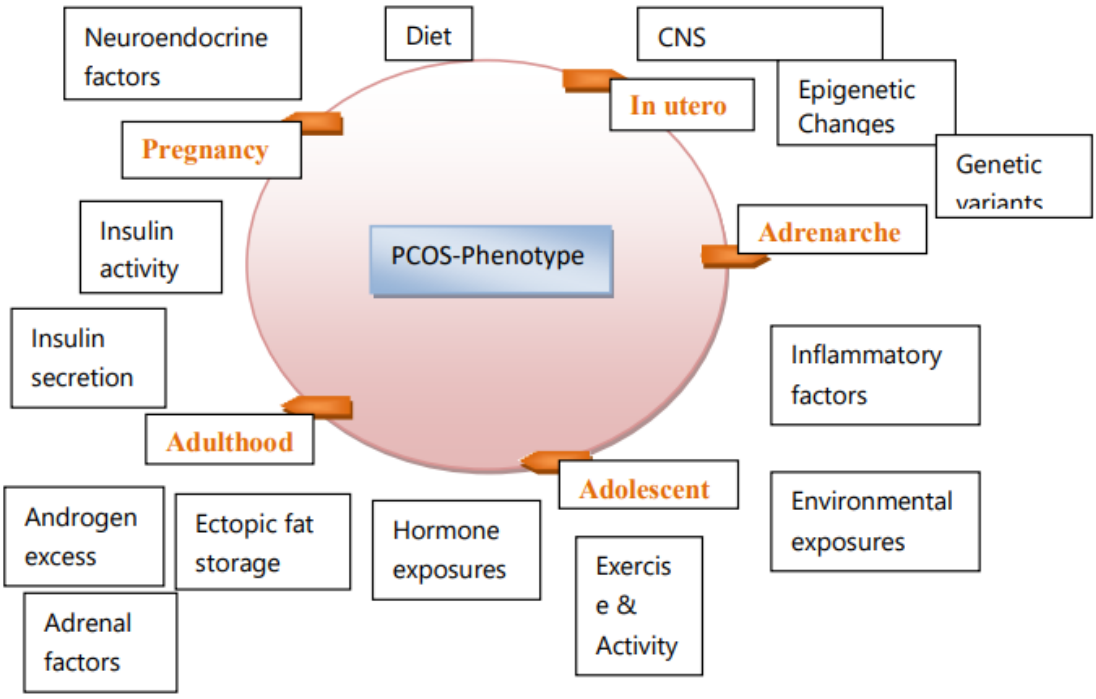

Figure.1 Factors contributing to PCOS phenotype. PCOS encompasses a woman's life cycle. Factors potentially impacting the pathophysiology of PCOS are shown in circles. Not all factors affect each individual. PCOS epitomizes a biologic network of interacting neuroendocrine, hormonal, metabolic, genetic, and environmental influences.

he precise signaling mechanisms initiating follicular activation are inadequately understood. Presumably a balance of factors influences the options- durability in a resting state over activation. One similar factor appears to be follicle viscosity. Following activation from the resting pool, original follicular growth is gonadotropin-independent until the antral stage. Anti-Mullerian hormone (AMH), a glycoprotein buried by granulosa cells, inhibits original follicular reclamation and indicates follicular reserve. **(Yang et al., 2023) .** In discrepancy to mice where AMH inhibits pre-antral follicle growth and antral follicle development, AMH appears to promote growth of pre-antral follicles to the antral stage in inhuman primate (NHP) ovaries Peak AMH attention are set up in antral follicles. Once FSH-stimulated granulose cell estradiol attention achieves the necessary threshold, estradiol suppresses AMH expression .

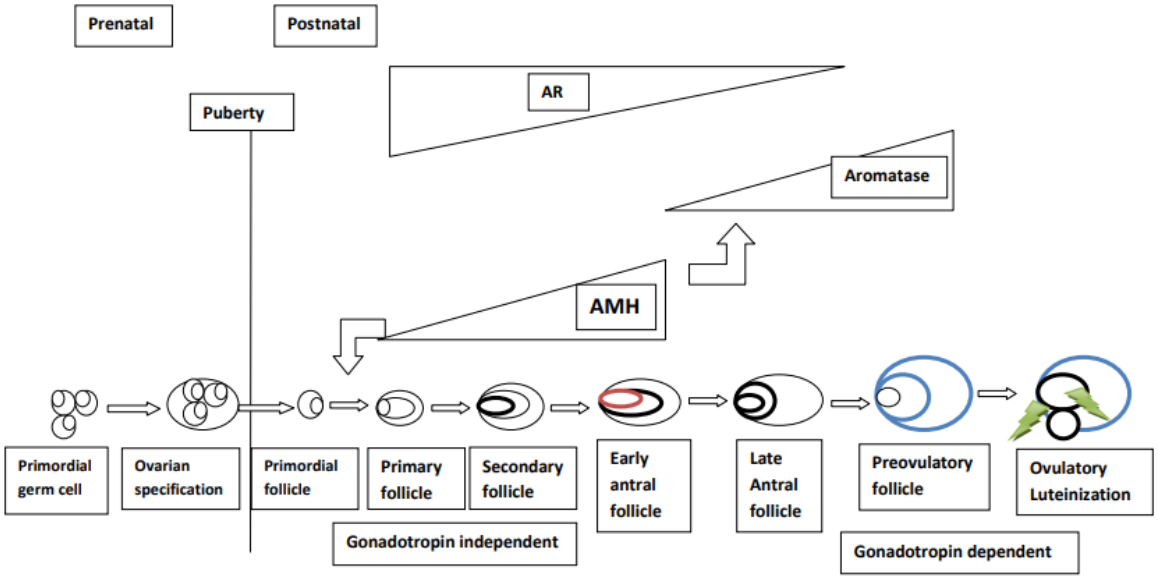

Figure.2 Ovarian follicle development .This illustration shows ovarian follicular development during developmental periods.

Insulin Resistance in PCOS: The factual understanding of insulin resistance can be explained by the demand of inordinate insulin for the metabolic conditioning, The rapid-fire and fast glucose analysis make the experimenters suitable to dissect insulin resistance. The rotundity of tummy in PCOS is the reason of insulin resistance conceivably convinced via subclinical lump but whether the metabolically activeintra-abdominal adipose apkins are stoked or not is unclear **(Sadegji et al., 2022).**

Although different styles have been used for frequency of insulin resistance, where it was set up to be varied in PCOS women with respect to the discovery system, more recent findings concluded that rotundity is the main threat factor of insulin resistance in individualities suffering from PCOS. Many clinical studies have reported the glucose forbearance in PCOS women and T2DM threat in PCOS individualities. All those PCOS ladies who are fat and fat are at lesser threat of the disturbances in glucose metabolism and they needed checking their glucose regularly with proper metabolic profiling **(Zhao et al., 2023).**

1) Pathways of Insulin Resistivity in Patients with PCOS : Insulin is receptor list hormone that binds to its membrane glycoprotein. Is consists of two subunits α and β, associated with disulphide bonds. Subunit α is extracellular region responsible for the list point, while subunit β bis the intracellular region responsible for provoking natural tyrosine kinase exertion. Ligand tapes lead to generating natural tyrosine kinase exertion in subunit β and initiate tyrosine phosphorylation. **(Yang et al., 2023)** At further leads to the metabolic conditioning of insulin upon substrate list, for illustration, glucose transport and glycogen conflation. PCOS is a health issue for women and insulin resistance is one of the pivotal issues that need to be emphasized. Insulin's an essential hormone for glucose metabolism and its sensitization is necessary for proper glucose uptake and metabolism. The cell face receptor is homologous with the insulin- suchlike growth factor 1(IGF- 1) receptor, so there's specific commerce for the list of insulin to face **(Shaaban et al., 2021).**

2) Impact of PCOS on Physiologic Functions: PCOS is a miscellaneous complaint of endocrine system which is followed by colorful clinical and physiological abnormalities. It exerts dangerous and pervasive goods on physiological as well as metabolic system, and these characteristics orders PCOS as a complaint associated with metabolism. colorful dysfunctions like insulin resistance, hyperinsulinemia, rotundity, dyslipidaemia, hypertension, elevating threat of developing T2DM, endometrial hyperplasia, and coronary roadway conditions. Then, we bandied the impact of the PCOS on colorful physiological functions of the body **(Zehravi et al., 2022).**

Liver Function. PCOS is a eclectic complaint of endocrine system which is followed by various clinical and physiological abnormalities. It exerts dangerous and pervasive goods on physiological as well as metabolic system, and these characteristics orders PCOS as a complaint associated with metabolism. Various dysfunctions like insulin resistance, hyperinsulinemia, obesity, dyslipidaemia, hypertension, elevating trouble of developing T2DM, endometrial hyperplasia , and coronary thruway conditions. Also, we mooted the impact of the PCOS on various physiological functions of the body **(Won et al., 2021)**

Cardiac-Functions. It was concluded that all the PCOS phenotypes have serious cardiovascular pitfalls in PCOS cases. Phenotypes, insulin resistance, hyperinsulinemia, overexposure of androgens, and ovaries function are reported to display increased cardiovascular health threat for PCOS women Insulin resistance is associated with the inactivation of NO after release from endothelial cells and dropped product of nitric oxide(NO) and conflation of vasoconstriction agents in inordinate quantities; all these blights lead to disabled vasodilatation and cardiac muscles stiffness **(Sangaraju e al., 2022).**

Polycystic Ovary Syndrome and COVID-19 Pandemic: Ethnical predilection, hyperactive- inflammation, hyperandrogenism, and low Vitamin D situations are certain factors that have been explosively associated with PCOS as well as a threat of severe COVID 19. Along with these, women in the reproductive age group are largely prone to multiple cardio- metabolic conditions, similar as type 2 diabetes, hypertension, rotundity, and differences in the gut microbiome, which increase the threat for adverse COVID - 19 – affiliated issues. Women in the reproductive age group are largely prone to multiple cardiometabolic conditions, similar as type 2 diabetes, hypertension, rotundity, and differences in the gut microbiome, which increase the threat for adverse COVID 19 – affiliated issues. In fat/ fat women, a minimum of 5 weight loss has been associated with increased fertility and bettered gestation issues. This was a major challenge during the lockdown due to COVID 19 epidemic, which led to a drastic lowering of success in weight loss programs despite acclimations **(Yang et al., 2022).**

Risk Factors For Polycystic Ovarian Syndrome: Positive family history, rotundity/ weight gain, history of epilepsy, diabetes, etc., have been linked as threat factors for PCOS among women in the reproductive age group. Girls born to fat/ fat women, low birth weight, and natural virilization were linked to increase the threat of PCOS in children. Irregular period, unseasonable pubarche, rotundity runs, and acanthosis nigricans are a many of the threat factors apparent latterly in nonage IR has been demonstrated extensively in women with PCOS. A recent SRMA studied literature with BMI matched controls and showed a advanced frequency of metabolic pattern in women with PCOS compared to women without PCOS **(Nirupama et al., 2022)**.

Management: Lifestyle and Behavioral Approaches- Life interventions similar as diet, exercise, and behavioral approaches for all women with PCOS. S. An earlier study on a hyperandrogenic PCOS mouse model revealed that PCOS traits were stoked widely by diet. Reproductive traits were shown to have a lesser perceptivity to salutary macronutrient balance than metabolic traits, suggesting that the development of substantiation grounded salutary interventions Lifestyle and behavioral approach (LBA) has always been considered the first line of treatment for PCOS, especially in fat/ fat women. Increased physical exertion, salutary differences, and weight loss have been suggested as some of the first line life interventions for women with PCOS **(Xu et al., 2022)** . Despite substantial substantiation grounded guidelines, the intensity, complexity, and behavioral factors of life variations aren't easily understood, and 45 of women with PCOS report that LBA was no way suggested as a operation volition. Increased physical exertion, salutary differences, and weight loss have been suggested as some of the first line life interventions for women with PCOS LBA should also include changes in alcohol use, psychosocial stress, and tobacco consumption, for long- term operation of PCOS. In the current situation of the COVID 19 epidemic, lockdowns counter blockade, and insulation, maintaining good physical exertion and monitoring diet are proving to be the major challenges for women with PCOS. Substantiation suggests that short- term weight loss is successful in dwindling IR and restoring fertility **(Zigarelli et al., 2022)** .

Character strengths of women with polycystic ovary syndrome: Polycystic ovarian pattern (PCOS) is a hyperandrogenic miscellaneous endocrine complaint that affects 15 – 20 of women in their reproductive age when using Rotterdam criteria. Interest in cerebral aspects of PCOS cases has grown as attendant symptoms are being decreasingly honored by rehearsing clinicians., the part of character strengths(CSs), within the field of positive psychology, has gained adding interest and attention in cases dealing with habitual ails. Character strengths are considered positive traits reflected in studies, passions, and actions. They contribute to one tone's fulfillment, happiness, and life satisfaction **(Ghazeeri et al., 2022)** .

Management of PCOS:

Pharmaceutical:

Oral contraceptives combined with anti-androgens continue to be the standard operation authority to bring down androgen situations and treat symptoms while contemporaneously offering endometrial protection. Recent substantiation also suggests that treatment of PCOS cases with 3 mg drospirenone 20 µg ethinyl estradiol combinations is salutary for hormonal imbalance and lipid profile while having a substantial safety profile **(Rocha et al., 2019).** Clomiphene citrate (CC) continues to be the operation choice for ovulation induction in anovulatory PCOS women. An volition of2.5 mg/ day letrozole(aromatase asset) has been suggested to induce ovulation in CC remedy failure cases. Clomiphene acts by blocking the hypothalamic – pituitary axis from circulating estrogen. Being structurally analogous to estrogen, clomiphene blocks hypothalamic receptors and therefore triggers FSH release from the anterior pituitary following differences in GnRH pulsatility. Insulin sensitizing agents, Myo-inositol, act as alternate couriers in insulin signaling, which are likely backups to Metformin in PCOS with IR(IR PCOS) by significantly reducing the theca/ granulosa cell sub caste consistence rate and the time to gestation. A trial on teenagers with PCOS reported that after entering Myo-inositol, significant reduction in weight, BMI, glucose, Peptide, insulin, and LH was detected. At the same time, the Oral Contraceptive lozenge(OCP) arm reported slight increase in weight and BMI slightly increased, while the metabolic parameters remained unchanged **(Akre et al., 2022)** .

Management Surgical: laparoscopic ovarian drilling (LOD) has advanced into a largely effective and safe surgical treatment for PCOS women, impassive to CC remedy. It glasses the goods of gonadotropin using gestation and live births banning pitfalls of ovarian hyper stimulation or multiple gravidity, along with a pronounced enhancement in ovarian responsiveness to succeeding remedy with ovulation induction agents. Irrespective of the presence or absence of other causes of gravidity, women with PCOS frequently have a receptivity disfigurement in the endometrial which latterly affects their fertility status **(Fernandez et al., 2018).** In terms of ovarian drilling, bilateral LOD fashion was shown to be more effective than the unilateral in terms of menstrual cycle chronicity, ovulation induction, and snowballing gestation rates in women with CC resistant PCOS. Endometrial hyperplasia and PCOS(both of which are related to an amplified threat for developing endometrial melanoma) have been linked as hypothetically new suggestions for bariatric surgery. Some of the foremost bariatric procedures in the present period are laparoscopic malleable gastric banding, laparoscopic sleeve mastectomy, and Roux en Y gastric bypass. Irrespective of age, the threat and inflexibility of stroke can be regulated by gonadal hormones **(Hachul et al., 2019)**. Endometrial hyperplasia and PCOS both of which are related to an amplified threat for developing endometrial melanoma have been linked as hypothetically new suggestions for bariatric surgery. Bariatric surgeries have been shown to ameliorate utmost of the pivotal individual features seen in PCOS and women with ovarian volume.

Management: Other Practices of Medicine-PCOS has always been a well explored field with numerous reciprocal medical practices coming up with possible remedies from their different knowledge diapason. Irrespective of whether it's the administration of the Chinese traditional herbal drug, Cangfu Daotan decoction, part of gut microbiota, or the use of Yoga and Ayurvedic herbal fusions, or the effect of homeopathic phrasings similar as Calcarea carbonica in perfecting menstrual chronicity, there are a vast variety of probable remedies being suggested for PCOS **(Meier et al., 2018).**

Healthy Lifestyle and Dietary Approaches: PCOS is more common in women with a inheritable predilection, but environmental factors including rotundity and sedentary behavior, a diet high in unhealthy fats can also quicken its onset. Rotundity or fat affects 50 of PCOS cases. Insulin resistance has been set up in numerous women with PCOS indeed if they aren't fat. Also, 40 to 50 of women with PCOS and 80 of women with PCOS who are fat have insulin resistance and hyperinsulinemia. Changes in life, similar as increased physical exertion and a healthier diet, can prop in the operation of this illness. Weight operation is the first line of defense against PCOS, as rotundity and insulin resistance are associated with it. still, there's no agreement on the applicable food composition. Insulin sensitizers, Metformin, and thiazolidines are among the most recent exemplifications of pharmacotherapy. Acupuncture and satins are two new types of remedial tools on the horizon **(Malamouli et al., 2022).**

Machine-Aided Self-diagnostic Prediction Models: In this study, we bandy the development of vaticination models for the tone- opinion of polycystic ovary pattern(PCOS) using machine literacy ways. p tone- individual vaticination models for PCOS in implicit cases and clinical providers. For implicit cases, the vaticination is grounded only on noninvasive measures similar as anthropomorphic measures, symptoms, age, and other life factors so that the proposed vaticination tool can be accessibly used without any laboratory or ultrasound test results. Telehealth using remote technologies between medical providers and cases is another arising trend during the epidemic, and numerous conditions are diagnosed and managed through telehealth, including polycystic ovary pattern (PCOS). Opinion of PCOS with telehealth is grounded on a many symptoms similar as irregular menstrual cycles, Hirsutism, skin problems, and other symptoms caused by an imbalance of androgen hormones. Machine literacy and deep literacy ways have been extensively used to dissect health data and ameliorate individual delicacy and perfection, complaint treatment, and forestallment **(Zigarelli et al., 2022).**

Phytotherapy of polycystic ovary syndrome: Phytotherapy is the practice of using drugs deduced from shops or sauces to treat or help health conditions. The main clinical features of PCOS are being fat, hyperandrogenemia, polycystic ovarian morphology and hyperinsulinemia. Increases in oxidative stress situations and seditious labels, LH and androgens, and a significant reduction in follicle stimulating hormone(FSH) and estrogen have been reported in cases with PCOS and also in beast models of PCOS. It has been shown that non-chemical and herbal constituents can have considerable goods on recovery and enhancement of some abnormalities and diseases in PCOS cases, and numerous studies have been conducted on their goods on the hormonal and metabolic factors and hypothalamic-pituitary- ovarian axis in PCOS **(Escobar et al., 2018)** .

Ovulation Inducers:

Ovulation inducement is the cornerstone of treatment for infertile PCOS patients who want to become pregnant because 70% of women with PCOS have dysovulation or no ovulation.

1) **Clomiphene citrate is a selective estrogen receptor modulator (SERM):**
   Clomid citrate (CC) is the drug of choice for ovulation induction in polycystic ovarian syndrome in adolescents. By inhibiting estrogen receptors in the hypothalamus, CC works as an anti-estrogen, increasing the pulse width of gonadotropin-releasing hormone (GnRH) in the anterior pituitary as well as an increase in follicle-stimulating hormone production (FSH). Luteinizing hormone (LH) is a hormone that aids in the development of follicles **(Akre et al., 2022).**

2) **Aromatase inhibitors (AI)-letrozole:**
   Aromatase transforms androgens into estrogen. In the third generation, letrozole is the most widely used non-steroidal selective AI for inducing ovulation. Letrozole inhibits ovarian estradiol secretion. The sensitivity of the follicles to FSH rises when the pituitary secretes more FSH, increasing the ovulation rate. This is due to the hypothalamus's release of negative feedback and a short rise in androgens in the ovary **(Akre et al., 2022).**
3) **Medroxyprogesterone acetate:**

PCOS patients who are unable to conceive and are not in danger of becoming pregnant, amenorrhea, or irregular uterine bleeding can be treated with Medroxyprogesterone acetate (MPA). Ovarian androgen production is suppressed by monthly progestogen therapy, but abnormal endometrial development is not.

Table of Non-Chemical and Herbal medicine in PCOS (Abasian et al., 2018, Khanage et al., 2019)

Herbal medicine	**Model/Design**	**Duration/Doses**	**Mechanism**
Anise	Rats/estradiol valerate induced PCOS	200mg/kg,400mg /kg for 15 days	1.Reduces signs of pcos be effects on the history- morphologies of ovarian tissue 2. Ameliorated the hormonal profile of PCOS (FSH, LH, P4)
Sausage Fruit	Human trial (two PCOS patients)	1tsp of powder twice daily before food for almost 2 yr's	1.Reduces Acne but no noticeable effects of Hirsutism 2.Reduced size of the right ovary to normal due to the strong anti-inflammatory effect of the plant and presence of specific COX1 and COX2 inhibitors
Fennel	Human trial (89 women)	250, 500, 1000mg/kg for 4-10days	Increases serum concentration of FSH and decreases LH & T
Wild indigo	Rats/estradiol valerate induced PCOS	200mg/kg for alters 3 consecutive estrous cycles	1.Increases infertility in female rates and reduced histopathological changes in ovary 2. "Increased fertility in female rats, and reduced histopathological changes in ovary and endocrinologic and biochemical changes due to hyperandrogenism"
Flax seed	Open-label interventional study (32 women with PCOS)	Orally 15 gr flax seed power for 3 months	1.Reduced the ovarian volume and number of follicles and improved the menstrual cycles but did not alter the body weight, blood sugar/Hirsutism 2. "Positive effect on PCOS, due to the reduction in T, E2, LH and insulin levels which contributed to follicular maturation, and the anti-inflammatory actions to the reduction in ovarian volume"
Pomegranate	Rats/estradiol valerate induced PCOS	100mgkg, 200mg/kg, 400mg/kg for 81 days	1.Reduced the effect of T hormone due to phenolic compounds present in pomegranates extract 2. Reduced the complications associated with PCOS and improved changes of female sex hormones by reducing the concentration of E2, free T, and andrestandion hormones in PCOS
Pergulasia	Rats/testosterone propionate induced PCOS	1ml fresh pergulasia leaves extract every day for 15 days	1.Ameliorated the essential hormones in the menstrual cycles FSH,LH,E2,P4 & T 2. 2. Reduced LDL, triglycerides, cholesterol and glucose levels in the serum, and helped manage obesity

			pattern in PCOS rats.
Fengugreek seed	Open-label surveillance study (50 women with PCOS)	2 capsules of 500mg/day for 9 days	Reduced both left and right ovarian volume and no. of ovarian cysts but no significant adverse effects in serum ALT,BUN and CK2 2. Increased LH and FSH levels and a small decrease in LH: FSH ratio 3. Effective in alleviating the symptoms of PCOS and demonstrated broad-spectrum safety and efficacy
Licorice	Human trial (seven men)	7gr of commercial preparation of licorice tablets for a week	Decreased T2 inhibited conversion of andrestandion to T and might uses for abdrogenization
Palm pollen	Rats/estradiol valerate induced PCOS	200mg/kg, 400mg/kg for 21 days	1.Reduced the no. of cyctic follicles, improved tissues symptoms, and adjusted the levels of sex hormones in pcos 2. "Increased the number of primary, antral and graaffian follicles as well as the corpus luteum"

Life style modifications:

Exercise Modifications: Exercise conditioning would help womanish cases gain benefits, and this view is getting accepted among croakers and cases. Lately, a meta- analysis reported that advancements in health issues are more likely to be linked to the exercise intensity rather than the exercise itself. An RCT study indicated exercise variations with vigorous intensity (eight successive weeks and three sessions of supervised exercise training each week for the final four successive weeks). Some other studies reported that women with PCOS could gain enhancement, in terms of insulin perceptivity and abnormal androgen position, via vigorous aerobic exercise and resistance training. The minimal aerobic exertion is recommended as further than 150 min per week, including ferocious exercise for further than 90 min **(Xing et al., 2022, Gu et al., 2022**).

Weight Modifications: While it's recommended to reduce the calorie input and induces weight loss among PCOS women with rotundity, utmost of the current proposed recommendations regarding salutary variations in PCOS are grounded on studies in fat women without PCOS. Therefore, weight revision is recommended as a first step in the operation of PCOS cases that are fat or fat. Women with PCOS and normal weight and BMI also have an increased threat for metabolic diseases and habitual fatigue. Women with PCOS to make variations in weight applicable BMI should be maintained by weight monitoring **(Sam et al., 2019).**

Mood Modifications: Acupuncture therapy: is extensively used in the treatment of depression, and has good efficacity in easing PCOS symptoms. Acupuncture remedy can effectively relieve depression in PCOS cases, and the medium may be related to the regulation of serum β- endorphin and androgen situations. And the goods of acupuncture persisted for at least 4 months after treatment ended. Another secondary disquisition to assess how electro acupuncture affected anxiety and sadness in unattached women with PCOS set up that acupuncture could alter serum norepinephrine(NE) and 5- HT situations and thereby lessen PCOS depression symptoms **(Fernandez et al., 2018).**

Sleep Modifications: It's important that cerebral issues are considered as both a implicit threat and a maintaining factor of illness, particularly in adolescent and youthful womanish subjects. The mechanisms of the associations have been proven to be linked to relative autonomic pathways, endocrine diseases, and seditious status, which are

responsible for the development of PCOS. thus, it's presumptive that sleep variations are of great significance among PCOS cases. Some studies reported that women are more likely to be disturbed by type 2 diabetes if the length of sleep isn't further than 5 h per night when compared with women whose length of sleep ranges from 7 to 8 h per night **(Hachul et al., 2019).**

SUMMARY:

PCOS is a complex complaint involving multiple organ systems with onset during the early pubertal times. The list of factors involved in the pathophysiology continues to expand, with accruing substantiation indicating that hyperandrogenism is a vital factor affecting multiple apkins. GWASs have linked genes common to both Han Chinese and white populations that are involved in neuroendocrine, metabolic, and reproductive pathways. Data attained from beast models have constantly intertwined testosterone as an important factor in the pathogenesis of PCOS. The important benefactions of ectopic fat storehouse and adipocyte androgen biosynthesis are arising. Promising clinical and preclinical data point toward neuroendocrine involvement with supporting places for GABA signaling and neuronal ARs. At this time, an personalized treatment plan can be developed for the adolescent girl with features of PCOS. Attention to the history, physical examination, and laboratory data is important to identify adolescent girls at threat to develop PCOS. Whereas postponing individual labeling may be applicable, treatment of clinical features and co-morbidities is vital to the health and tone- regard of these cases. One unborn thing includes forestallment through timely identification of at- threat prepubertal and early pubertal girls through life interventions. The life variations in PCOS, including diet variations, exercise variations, sleep variations, mood variations, and weight variations. While physical revision, applicable salutary revision, and maintaining healthy sleep revision and mood revision are recommended for the operation of colorful PCOS conditions, further perspective studies are demanded on the goods of life variations on PCOS.

CONCLUSION: In conclusion, we showed that women with PCOS have advanced scores of judgement, stopgap, perspective, and preponderancy as character strengths in comparison with healthy cases. This review demonstrated the variability and goods of Phytotherapy and non-chemical treatments associated with PCOS complaint. Streamlined wit into the interrelation between brain, fat, muscle, and ovarian towel aid the conception of PCOS being a systemic pattern. The proposed study offers great eventuality that our tone- individual vaticination models for PCOS status can serve as a accessible and easy- to- use digital platform grounded on available health measures for both implicit cases and clinical providers. Women with PCOS face insulin resistance and overexposure of androgen, leading to a number of metabolic and reproductive abnormalities. Making healthy life choices, getting enough exercise, and eating the right foods can help women with PCOS. There isn’t a perfect diet for women who have PCOS because it hasn’t been discovered as yet.

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